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Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, DC 20554

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FEDERAL COMMUNICATIONS COMMISSION
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In the Matter of	)	
	)	
Co-Primary Allocation of 2300-2305 MHz to the Amateur Radio Service and the Miscellaneous Wireless Communications Service	)	**RM-10166**

To: The Commission

COMMENTS OF ARRL, THE NATIONAL ASSOCIATION FOR AMATEUR RADIO IN OPPOSITION TO PETITION FOR RULE MAKING

ARRL, the National Association for Amateur Radio, also known as the American Radio Relay League, Incorporated (ARRL), by counsel and pursuant to Section 1.405 of the Commission's Rules (47 C.F.R. §1.405) hereby respectfully submits its comments in opposition to the Petition for Rule Making filed on or about April 9, 2001 by AeroAstro, Inc. (AeroAstro). The Petition was placed on Public Notice July 2, 2001, and therefore these comments are timely filed. The Petition proposes that the Commission (1) reallocate the 2300-2305 MHz band on a co-primary basis to both the Amateur Radio Service (ARS) and the Miscellaneous Wireless Communications Service (MWCS); and (2) to impose technical and operational limitations on Amateur station operation in that band, in order to protect the MWCS. In the interests of the Amateur Radio Service in continued and improved access to this band, ARRL states as follows:

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List A B C D E

I. Introduction

1. ARRL has sought a primary allocation at 2300-2305 MHz since 1996.[1] Amateurs make substantial, regular use of this band for a variety of uses. Amateur operation is especially heavy in the segment centered at 2304 MHz, for weak-signal communications over long terrestrial paths. There are also propagation beacons which are received at ubiquitous locations to determine propagation paths and enhanced propagation characteristics. These communications and propagation studies involve extremely sensitive receivers and very low received signal levels. Though AeroAstro characterizes the 2300-2305 MHz band as an "orphan" in view of the adjacent auctioned spectrum at 2305-2320 MHz (and at 2345-2360 MHz) in the MWCS[2], ARRL does not view the 2300-2305 MHz band in the same way. The 2300-2305 MHz segment, as it is and has been used by Amateurs, is a reasonable buffer between the auctioned, and presumably higher-density uses of the MWCS above 2305 MHz and the Space Research (space-to-Earth) primary allocation at 2290-2300 MHz. A recitation of the extent and nature of the use of the 2300-2305 MHz segment by the Amateur Service was contained in ARRL's May 7, 2001 Petition for Rule Making, RM-10165, and ARRL would incorporate that discussion by reference herein.

2. Other than the characterization of the 2300-2305 MHz segment as an "orphan",

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[1] ARRL filed on November 19, 1996 a "Petition of the American Radio Relay League, Incorporated for Issuance of Further Notice of Proposed Rule Making" in ET Docket No. 94-32. Though the Commission noted the filing of this Petition shortly thereafter (See the *Report and Order*, Docket 96-228, 6 CR 771, FCC 97-50, released February 19, 1997, at fn. 59) no further action was taken in that proceeding relative to the 2300-2305 MHz band. On May 7, 2001, ARRL renewed that request in its Petition for Rule Making, RM-10165, now pending.

[2] See the AeroAstro Petition, at p.1.

AeroAstro's petition provides a reasonably accurate summary of the allocation history of this band. In particular, the Petition concedes the obligation placed on NTIA and the Commission by Congress in the *Omnibus Budget Reconciliation Act of 1993* (OBRA), P.L. 103-66. Therein, Congress instructed that, in identifying spectrum for transfer to non-Government use, the Secretary of Commerce must avoid "excessive disruption of existing use of Federal Government frequencies by amateur radio licensees." 47 U.S.C. §923(c)(1)(C)(iii). Furthermore, in identifying spectrum for reallocation and considering possible non-Government uses of the bands identified, the Secretary of Commerce was to consider "the extent to which, in general, commercial users could share the frequency with amateur radio licensees." 47 U.S.C. §923(c)(3)(C). This sentiment was again specifically noted in the 1997 Balanced Budget Act (BBA) at Title III. See, 47 U.S.C. §923(c)(1)(C)(iii).

3. AeroAstro's petition, at page 6, quotes a portion, *but not all*, of NTIA's statement concerning the 2300-2305 MHz band, following OBRA. NTIA was pessimistic about any sharing between the Amateur Service and commercial uses, as review of the entirety of the quote reveals. The Final Spectrum Allocation Report, NTIA Special Publication 95-32, February, 1995, at Appendix B, stated as follows:

> Sharing between Federal Government users and the amateur service has been successful largely because Federal operations are generally located outside of highly populated areas (citation omitted). It is very unlikely that the Amateur Service will enjoy an analogous situation with a commercial or other private sector service. If commercial services are to share with the weak signal operations located at 2303.75 - 2304.75 MHz, they must be able to withstand potential interference from the high-powered transmitters used for those operations, but not create interference to the sensitive receivers used. This is something of a contradiction that tends to point to relatively low powered devices that operate over short distances, such as devices authorized under Part 15 of the Commission's Rules, or to operations with a lower density of use that may be located in relatively remote areas. Similar operations should also be compatible

> with amateur service fixed operations, as would commercial fixed operations that can be coordinated with amateur systems.

Id., at 26.

In any case, at page 8 of the Petition, AeroAstro concedes that any commercial service in the 2300-2305 MHz band must protect Amateur operations. The question is, does the instant Petition make the requisite *prima facie* showing of non-interference and compatibility, given the allocation plan proposed? ARRL contends that it does not.

II. The AeroAstro Proposal is A Trojan Horse

4. AeroAstro proposes that MWCS use of the 2300-2305 MHz band should be permitted according to the same technical rules as are permitted currently for other MWCS bands under Part 27. AeroAstro specifically suggests permitting any type of fixed, mobile, or radiolocation services, and requests no service-specific rules governing eligibility, permissible communications, common carrier status, spectrum cap, aggregation limits, build-out requirements, or any other operational limitations, other than certain power and emission limits. These include 1-watt EIRP average power;[3] spread-spectrum emissions; out-of-band limits of 70 dB below 1 Watt average; terrestrial operation only; no space-to-Earth operation, and no operation at Fort Irwin, California. AeroAstro claims that these parameters were "requested by NTIA", though ARRL is not aware of any such "request" having been made. In fact, the parameters proposed in the petition are inconsistent with the cautionary note of NTIA cited above. The proposed parameters do not describe Part 15-level devices; there are no power

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[3] The average power reference is interesting. Relative to Part 15 periodic emitter devices, power averaging (per Sections 15.231 and 15.35) is done over an averaging period of 0.1 seconds. AeroAstro notes that its devices have a typical transmission time of 1.28 seconds. Its reference to its own devices having an average power of 1 microwatt is misleading.

spectral density limitations; and operation is not limited, as NTIA recommended, to relatively remote areas. Finally, since the Commission has proposed in another proceeding[4] to eliminate the processing gain requirement for spread spectrum devices operating under Part 15, there may be virtually no interference protection offered by this Petition to Amateur receivers in the 2304 MHz range.

5. There is nothing contained in the four corners of the AeroAstro petition that would indicate the extent of compatibility between incumbent and future Amateur operation, and the open-ended MWCS operation proposed by AeroAstro. There is no technical showing appended to the AeroAstro petition, but merely a bare claim of compatibility, or as AeroAstro puts it, "little risk of interference to Amateur operations." We are left to wonder how that conclusion was reached. The "Satellite Enabled Notification System" (SENS) which AeroAstro proposes to use in the band (provided that it is a successful auction bidder) is ubiquitous, mobile, and high-density. It is completely incompatible with Amateur operations in residential areas, and the aggregate interference effect of the devices and the SENS system is untested. There is no possibility whatsoever of coordination of operations as between auctioned MWCS and Amateur operations in the band, given the unpredictable and mobile Amateur uses, and the consumer-operated transmitters, terrestrial receivers and satellite uplink stations proposed by AeroAstro. As noted above, the 2300-2305 MHz band is traditionally the most heavily used portion of the Amateur allocations between 2300 and 2450 MHz. Due to its frequency separation from the noisy and cluttered 2400-2450 MHz segment, it is ideally suited to the weak-signal and

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[4] See, *Amendment of Part 15 of the Commission's Rules Regarding Spread Spectrum Devices*, FCC 01-158, released May 11, 2001, in ET Docket No. 99-231.

terrestrial beacon operations that Amateurs deploy there. For this same reason, Amateurs also use the 2300-2305 MHz segment for linear translator inputs and outputs. Any interference received in that band would be retransmitted on other Amateur bands. AeroAstro would propose to use the entire 2300-2305 MHz band for MWCS use, and it is apparent therefore that the proposal is fundamentally incompatible with incumbent and future Amateur operation.[5]

6. Neither is there "reverse" compatibility between the AeroAstro MWCS proposal and Amateur transmitters. AeroAstro admits at page 13 of its petition that "low-power services, such as AeroAstro's...cannot easily coexist with ubiquitous high-power transmitters." This is obvious from the description of the SENS system described in its petition, which involves satellite receivers and terrestrial, tower-mounted receivers. NTIA has warned that any commercial use in the 2300-2305 MHz band would have to be able to "withstand potential interference from the high-powered transmitters" used by Amateurs. Instead, AeroAstro proposes to restrict Amateur transmitter power to 100 watts for what it terms "narrowbeam operation", an example of which includes Earth-moon-Earth (EME) operation, with an antenna beamwidth of 5 degrees or less, limited to SSB or CW. For all other operation, including Amateur television, digital networks, and any other Amateur use (including, for example, terrestrial weak-signal operation using greater antenna beamwidth than 5 degrees) 25 watts EIRP. This is totally unacceptable. It is

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[5] It is impossible to understand how, if AeroAstro's system architecture is compatible with Amateur Radio stations (which, even assuming the enactment of AeroAstro's proposed Draconian power limitations, would still operate at unlimited EIRP levels) it would not be possible to operate that system in one of the many bands in which Part 15 devices are permitted to operate at relatively high power levels. Surely AeroAstro's system can operate in the same environment as those in which microwave ovens operate, for example. The only benefit to operation by AeroAstro under rules other than Part 15 seems to be that the Part 15 rules impose a non-interference obligation on intentional radiators.

preclusive of most Amateur operation currently in the band. A "primary" allocation for the Amateur Service incorporating these parameters would be a "Trojan Horse": it is meaningless for the Amateur Service to have a primary allocation in the band, but at the same time to be subject to operating restrictions which preclude even current types of operation. To have as a sharing partner a commercial service which has acquired a license through an auction is difficult conceptually, but it is impossible to conceive how one that utilizes tower-mounted receivers and satellite receivers would be compatible with existing Amateur uses. From the Amateurs' perspective, the status quo, where no service has a primary allocation in the band and Amateurs are secondary, is far preferable to the AeroAstro proposal.

7. Perhaps the best reason why there should not be any allocation for MWCS in this band as proposed by AeroAstro is that the proposed users of the devices to be authorized, consumers using the devices on a mobile basis, would not be able to meet any standard of responsibility in addressing interference avoidance and remedies relative to Amateurs. The devices would not have frequency agility or the ability to be frequency coordinated, either in advance or in real time. If there is interference caused by one co-primary user to another co-primary user, there must be the ability and obligation to mitigate that interference. There can be no mechanism for doing this with AeroAstro's architecture. Most consumer radio users are not responsive to complaints of interference from their equipment, and understandably feel that any interference to their equipment which causes undesired operation requires a remedy.

8. The instant petition would, if implemented as AeroAstro proposes, complete the historical "winnowing" of the Amateur allocation at 2.3 GHz. An Amateur allocation that originally spanned the entire 2300-2400 MHz band is now reduced to 5 MHz at 2300-2305

MHz, and 10 MHz at 2390-2400 MHz.[6] The Amateur operations formerly conducted at 2305-2310 MHz have recently been compressed into the 2300-2305 MHz segment due to MWCS implementation in the former band. In addition, of the remaining Amateur allocation at 2.3 GHz, the only portion reasonably available for weak-signal EME and terrestrial communications is 2300-2305 MHz. The band is hardly, as AeroAstro claims at page 14 of its Petition, "underutilized"; it is heavily utilized, and cannot withstand the addition of an auctioned commercial service. While there may be compatible sharing possible at 2300-2305 MHz between the Amateur Service and other users,[7] the AeroAstro proposal falls far short of the level of compatibility necessary to comply with Congressional requirements.

III. The Commission Has Made Adequate Accommodation for the Types of Uses Proposed By AeroAstro

9. A similar type of use of the 2300-2305 MHz band was proposed recently by MicroTrax, Inc. in RM-9797. Microtrax requested allocation of 5 MHz from among the bands 1390-1400 MHz, 1427-1435 MHz; 1670-1675 MHz, 2300-2305 MHz, or 2385-2390 MHz for a personal monitoring and location service which required 5 MHz of spectrum. The Commission, in response to this and other proposals, issued on November 20, 2000 a *Notice of*

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[6] The Amateur Service still has access to the 2305-2310 MHz band, but as a practical matter, due to the advent of MWCS, which Amateurs have to protect, Amateur Radio has been displaced from that band. The same is true of the 2400-2450 MHz band, to the extent that high noise levels preclude many types of Amateur operation there. The noise floor in the 2400-2450 MHz band is increasing all the time due to increased deployment of consumer electronic devices, especially intentional radiators.

[7] For example, a compatible arrangement was negotiated to permit use of the 2390-2400 MHz band by both the Amateur Radio Service and Part 15 Asynchronous unlicensed PCS. See, the *First Report and Order and Second Notice of Proposed Rule Making, Allocation of Spectrum Below 5 GHz Transferred from Federal Government Use*, 10 FCC Rcd. 4769, 77 RR 2d 314 (1995).

Proposed Rule Making, FCC 00-370, 15 FCC Rcd. 22657, Docket 00-221, which proposed the allocation of 27 MHz of spectrum in various discrete bands which were transferred from Government use under OBRA and the Balanced Budget Act of 1997. AeroAstro participated in the RM-9797 proceeding. Among the allocations proposed by the Commission in the Docket 00-221 proceeding were the bands 1670-1675 MHz and 2385-2390 MHz for fixed and mobile service uses generally. The Commission stated, with respect to the 1670-1675 MHz band:

> In comments on MicroTrax' petition, AeroAstro introduces its Satellite Enabled Notification System (SENS) which will also locate small objects at relatively low cost. SENS is a one-way messaging service that enables users to transmit short messages for near-real-time receipt via the Internet. Like MicroTrax's PLMS, SENS will allow the location and tracking of people and objects, and the 1670-1675 MHz band is a potential band for the service (footnote omitted). Both MicroTrax's and AeroAstro's plans for this band appear to be compatible with protection of Government sites and radio astronomy operations. Both parties are confident of their ability to design their suggested systems to avoid causing interference to the Wallops Island or Fairbanks sites. Both parties also point out that their systems would also be of sufficiently low power that the likelihood of interference to radio astronomy operations in the subadjacent 1660-1670 MHz band would be minimized.
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> 15 FCC Rcd. at 22674.

As to the 2385-2390 MHz allocation, the Commission stated:

> We propose to allocate the 2385-2390 MHz band to FS and MS generally, and allow flexible use of the band, within the technical rules we adopt. We request comment on this proposal, especially on whether we should allocate this band more narrowly. We note that MicroTrax has identified the 2385-2390 MHz band as a candidate for its suggested PLMS.
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> 15 FCC Rcd. at 22675.

It is apparent from this proceeding that the Commission has made adequate provision for exactly the type of use that AeroAstro proposes, without compromising the 2300-2305 MHz Amateur allocation. The instant AeroAstro petition is therefore untimely, in that the Docket 00-221 proceeding has not been finalized. The bands 1670-1675 MHz and 2385-2390 MHz are not shown to be, nor are they, in any way inadequate to accommodate the use proposed by AeroAstro herein. The instant petition should therefore be dismissed.

IV. Conclusions

10. In summary, AeroAstro has not shown that there is any necessity for any additional MWCS spectrum beyond what has already been taken by the Commission for MWCS at 2305-2320 MHz and 2345-2360 MHz. There is a pending proposal by the Commission to allocate the 1670-1675 MHz and 2385-2390 MHz bands for exactly the type of use proposed by AeroAstro. AeroAstro has failed to show that there is any degree of compatibility whatsoever between (1) its proposed auctioned, ubiquitous service, involving mobile satellite uplink facilities and terrestrial mobile, consumer-operated transmitters and tower-mounted receivers, and (2) the variety of Amateur uses at 2300-2305 MHz. AeroAstro's co-primary allocation plan creates the illusion of sharing between licensed services, but in fact it would restrict Amateur operation in the band to the point that current operation would be precluded entirely. At the same time, the technical limitations proposed for MWCS in the band would not be sufficient to avoid interference to sensitive Amateur receivers, and no coordinated operation between the two services is possible under the circumstances.

Therefore, the foregoing considered, ARRL, The National Association For Amateur Radio, respectfully requests that the Commission take no action on the instant Petition relative to the 2300-2305 MHz band. Instead, ARRL requests that the Commission create a primary allocation for the Amateur Service as proposed in RM-10165.

Respectfully submitted,

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August 1, 2001

CERTIFICATE OF SERVICE

I, Christopher D. Imlay, do hereby certify under penalty of perjury that I caused to be served, this 1st day of August, 2001, via United States Mail, postage prepaid, a copy of the "COMMENTS OF ARRL, THE NATIONAL ASSOCIATION FOR AMATEUR RADIO IN OPPOSITION TO PETITION FOR RULE MAKING" on the following:

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